

CBL BIOLOGY: LIFE SCIENCE OPTION

BSCS Green Version 10th edition

Biology An Ecological Approach

Lesson Plan Quarter 1, Week 5, Day 1



Outcomes for Today

Standards Focus: 6bc

PREPARE

1. Background knowledge necessary for today's reading.

Up until the last century, human population growth and dispersal has been limited by the same factors that still limit most plant and animal populations.

Technology and factors such as the Industrial Revolution are prime contributors to human population growth.

Human growth is impacting the planet in many ways including factors that we still do not understand.

2. Vocabulary Word Wall.

Introduce 3 important, useful words from today's reading.

modify perspective eternal

- show, say, explain, expand, explode or buzz about the word briefly

- show, say and define the word quickly and add to the word wall

READ

3. Review the vocabulary and concepts previously covered in this chapter.

Start at the beginning and review the concepts and vocabulary covered so far.

- mention the setting and main ideas

- point to concept chart as you quickly review it

4. Read directions for investigation/activity. *Water, A Necessity of Life* pp. 54-56

5. Read text. Ch 2 *Populations* pp. 38-41 (2.8, 2.9, & 2.10).

- Shared Reading RRP: Read, React, Predict every 2-3 pages
 Tape Partner Choral Silent Round Robin Reading

setting	Characters	pages
Planet Earth	Human beings in increasing numbers	38-39

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events to the billboard

- discuss the text clarify the most important facts, concepts, ideas and vocabulary
- decide on the 3-5 most important **concepts** and post these on the **billboard**

Students might mention:

New inventions help humans survive in previously uninhabitable environments.
 Humans can change the environment they live in.

Food supply and distribution is the cause of many population problems.

Humans are changing the environment they live in. They are messing up their world.

Helping to make a better place to live is going to require that people get along and work together.

7. Post information on the billboard. Add new information to ongoing class projects on the wall.

- new **concept** information can be added to the billboard
- an answer can be added to a question from the KWL Chart
- new information can be added to ongoing charts and investigations

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity:

Using graphic data can help students understand population dynamics. The most common form of graphic illustration is the population pyramid. Studying population pyramids is a good way to see the future population growth in most countries. Information is available at:

<http://www.census.gov/ipc/www/idbpyr.html>

Have students research a variety of countries of interest. Assign several to be included in the student research including:

Mexico, Canada, Japan, China, Sweden, and the United States. These countries have very different future projected growth patterns.

Note: If the technology is not available to students, prepare printouts of population pyramids of these countries from this web site.

Other possible activities for a class group or individual

Bookmark Open Mind Portrait g6 Graphic Organizer

g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop

Poster Ad Map Retelling Reader's Theatre Cartoon Rap

Key Questions

What is homeostasis?

In reference to the population pyramids, name several countries that appear to be in homeostasis.

Will water be a limiting factor in future population growth? Why is this so?

What are some of the effects of human activity on the earth's environment?

Remember to ask literal structural idea craft author literature life evaluate and inference questions every day.

Key Paragraph

Food, water, and available space are some of the limiting factors that can affect the size and growth of the human population. Like all environments, the earth as a whole has a carrying capacity. Scientists do not agree about the exact carrying capacity of the earth for humans. If food were the only factor, some people claim the earth could support 7-8 billion people. Other people think that not even the current population can be maintained for long. Even with these disagreements, all agree that the human population cannot grow forever.

EXTEND

11. Prompt every student to write a short product tied to today's reading.

Have students read the lyrics to this pop hit from just a few years ago. It reached #1 on 07-12-69 on the Billboard Charts:

In The Year 2525 by Zager And Evans

In the year 2525
If man is still alive
If woman can survive

They may find
In the year 3535
Ain't gonna need to tell the truth, tell no lies
Everything you think, do, and say
Is in the pill you took today

In the year 4545
Ain't gonna need your teeth, won't need
your eyes
You won't find a thing to chew
Nobody's gonna look at you

In the year 5555
Your arms are hanging limp at your sides
Your legs got nothing to do
Some machine is doing that for you

In the year 6565
Ain't gonna need no husband, won't need
no wife
You'll pick your son, pick your daughter too
From the bottom of a long glass tube'
Whooooa

In the year 7510
If God's a-comin' he ought to make it by
then
Maybe he'll look around himself and say
Guess it's time for the Judgement day
In the year 8510
God is gonna shake his mighty head then
He'll either say I'm pleased where man has
been
Or tear it down and start again

In the year 9595
I'm kinda wondering if man is gonna be
alive
He's taken everything this old earth can give
And he ain't put back nothing

Now it's been 10,000 years
Man has cried a billion tears
For what he never knew
Now man's reign is through
But through eternal night
The twinkling of starlight
So very far away
Maybe it's only yesterday

In the year 2525
If man is still alive
If woman can survive
They may thrive
In the year 3535
Ain't gonna need to tell the truth, tell no lies
Everything you think, do or say
Is in the pill you took today(fading...)

**If you can find or download the song
play it first.**

Here is a link to the melody:

<http://frodisman.com/2525.html>

Ask students to react to the tone of the song. Now have students write their own song (or rap) about the future of Earth. Perhaps their song will have a more positive prediction for the future!

Here is more information to assist with this possible activity:

http://en.wikipedia.org/wiki/In_The_Year_2525#Song_summary

12. Close with a short summary.

Extend the reading to the students' lives or to the world.

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Biology An Ecological Approach

Lesson Plan Quarter 1, Week 5, Day 2



Outcomes for Today

Standards Focus: 6bc

PREPARE

1. Background knowledge necessary for today's reading.

A renewed awareness of the future of earth is beginning to spread. It is often referred to as "The Green Movement!"

The idea of the commons is not new and there are many examples of small "commons" everywhere.

Many of these public pieces of land are regularly abused. (Think about a public restroom as a commons!)

There are also examples of local groups "taking back" the commons for the good of the community.

What would our communities be like if there were no commons anywhere?

2. Vocabulary Word Wall.

Introduce 5 important, useful words from today's reading.

family alter

hover spirit

vow

thrive

- show, say, explain, expand, explode or buzz about the word briefly
- show, say and define the word quickly and add to the word wall

READ

3. Review the vocabulary and concepts previously covered in this chapter.

Start at the beginning and review the concepts and vocabulary covered so far

- mention the setting and main ideas
- point to concept chart as you quickly review it

4. Read directions for investigation/activity.

5. Read text. *Seedfolks* Chapter 1-3.

Read out loud to students the first chapter in the book, ***Seedfolks*** by Paul Fleischman. This is a delightful book and is really the story of a commons in inner city Cleveland, Ohio.

- Shared Reading RRP: Read, React, Predict every 2-3 pages
 Tape Partner Choral Silent Round Robin Reading

setting	Characters	pages
Cleveland, vacant trash-strewn lot	Kim	1-4
	Anna	5-10
	Wendell	11-16

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events to the billboard

- discuss the text clarify the most important facts, concepts, ideas and vocabulary
- decide on the 3-5 most important **concepts** and post these on the **billboard**

Students might mention:

- Kim is on a mission.
- She needs to prove something to her father.
- Ana is trying to figure something out.
- Wendell has a plan.
- The little vacant lot is a commons.

7. Post information on the billboard. Add new information to ongoing class projects on the wall.

- new **concept** information can be added to the billboard
- an answer can be added to a question from the KWL Chart
- new information can be added to ongoing charts and investigations

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity:

After reviewing the idea of the commons and reading aloud several chapters in Seedfolks to the students, take students on a short walk to identify a “commons” in the immediate vicinity. Ask them to visualize the possibilities for this plot of land. As a follow up activity, students could design what they would like to see happen to the plot of land. Give them guidelines such as resources available, etc. This could eventually turn into a class project.

Other possible activities for a class group or individual

- Bookmark Open Mind Portrait g6 Graphic Organizer
g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop
Poster Ad Map Retelling Reader's Theatre Cartoon Rap

Key Questions

- How is the vacant lot in Cleveland a commons?
 How is Kim going to connect to her father?
 What characters in this story so far are elders?
 How is this little lot in the story like the pasture in the video?

Remember to ask literal structural idea craft author literature life
evaluate and inference questions every day.

Key Paragraph

From Seedfolks:

I took out my spoon and began to dig. The snow had melted, but the ground was hard. After much work, I finished one hole, then a second, then a third. I thought about how my mother and sisters remembered my father, how they knew his face.

I dug six holes. All his life in Vietnam my father had been a farmer. Here our apartment house had no yard. But in that vacant lot he would see me. He would watch my beans break ground and spread, and would notice with pleasure their pods growing plump. He would see my patience and my hard work. I would show him that I could raise plants, as he had. I would show him that I was his daughter.

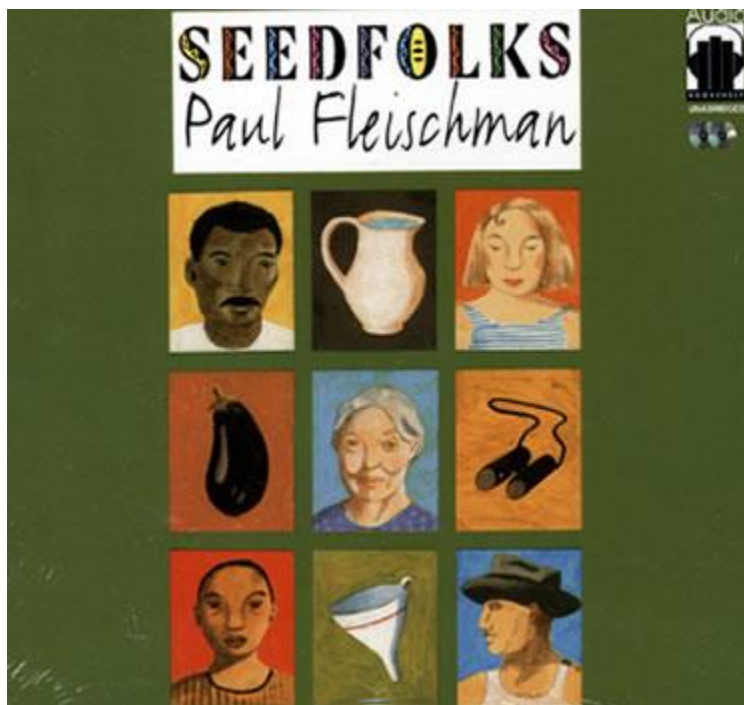
EXTEND

11. Prompt every student to write a short product tied to today's reading.

Have students think about a vacant lot nearby that resembles the one described in the story or the one they observed on the walk. Have students put themselves into their "story of the lot" by writing a paragraph about some sort of connection they would like to have with this "commons." The paragraph could be from the perspective of the land waiting for "someone or some group to take care of me" or perhaps the idea that we are "individual commons" just waiting for a little extra help to allow us to "bloom and grow."

12. Close with a short summary.

Extend the reading to the students' lives or to the world.



Seed Folks : Thirteen lives, One garden - Paul Fleischman

Paul Fleischman's book, Seedfolks is a good resource to understand the commons concept in a vacant lot in the inner city. Here are several reviews:

Editorial Reviews From School Library Journal

Grade 5 Up-Paul Fleischman creates a heartwarming story by weaving together a series of short vignettes about a vacant lot turned community garden. Set in a rundown section of Cleveland, Ohio, Fleischman's *Seedfolks* (HarperCollins, 1997) are a broad cross-section of ages, ethnic origins, and occupations. What unites all of these characters is the way they are changed by the simple act of growing vegetables or flowers. From the Vietnamese girl seeking a connection with the father who died before she was born. to the elderly wheelchair bound man who reconnects with the world, each character is unique. This book capitalizes on the diversity of the characters by using a large cast of narrators drawn from around the world. Though listeners may find some narrators difficult to understand, the richness of the variety of voices adds authenticity to the recording. Cassettes include chapter listings, and the sound quality is good.

Seedfolks is a nice addition to audio collections where Fleischman's work is popular, and worthy of inclusion in libraries serving ethnically diverse communities.

Barbara Wysocki, Cora J. Belden Library. Rocky Hill, CT

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From [AudioFile](#)

Fleischman's touching novel about an abandoned inner-city lot transformed into a community garden is composed of 13 interwoven stories. A Vietnamese immigrant schoolgirl describes how she sets out to grow lima beans in memory of her dead father. Barbara Rosenblat reads the narrative of an elderly Romanian woman who witnesses Kim planting the seeds and assumes a crime is being committed. One by one, strangers in the neighborhood overcome their prejudices and join in the gardening--the school custodian from Kentucky, the Guatemalan teenager taught by his uncle to plant vegetables from the old country, the muscle-bound African- American planting tomatoes to prove his love for his girlfriend, the British nurse helping her elderly patient find a new lease on life. Many of the performers are nonprofessionals, and don't try to be otherwise. But the sincerity and integrity of this project bear this garden delicious fruit. S.E.S. © AudioFile 2003, Portland, Maine-- *Copyright © AudioFile, Portland, Maine*

CBL BIOLOGY: LIFE SCIENCE OPTION
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Biology An Ecological Approach
 Lesson Plan Quarter 1, Week 5, Day 3



Outcomes for Today

Standards Focus: 6bc

PREPARE

1. Background knowledge necessary for today's reading.

This lesson deals with the evolving story of the South Central Farm, a community garden in Los Angeles. This garden developed on disputed "commons" land. It is a highly emotional issue with high student interest. To read about the story of the farm go to :

http://www.infoshop.org/wiki/index.php/South_Central_Farm

2. Vocabulary Word Wall.

Introduce 3 important, useful words from today's reading.

environmental racism

eminent domain

urban agriculture

- show, say, explain, expand, explode or buzz about the word briefly
- show, say and define the word quickly and add to the word wall

READ

3. Review the vocabulary and concepts previously covered in this chapter.

Start at the beginning and review the concepts and vocabulary covered so far

- mention the setting and main ideas
- point to concept chart as you quickly review it

4. Read directions for investigation/activity.

There are no readings from the text for this lesson.

5. Read text and print-outs from relevant websites on South Central Park.

The eviction process:

http://www.infoshop.org/inews/article.php?story=2006south_central_eviction

The latest information and updates from the official farm website:

<http://www.southcentralfarmers.com/>

Information on a local commons park in Watsonville, Calif.

<https://www.indybay.org/newsitems/2006/07/06/18285834.php>

- Shared Reading RRP: Read, React, Predict every 2-3 pages
 Tape Partner Choral Silent Round Robin Reading

setting	Characters	pages
South Central Farm	Community members, the police, etc.	

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events to the billboard

- discuss the text clarify the most important facts, concepts, ideas and vocabulary
- decide on the 3-5 most important **concepts** and post these on the **billboard**

Students might mention:

The park served poor people.

Most of the farmers were from minority groups.

Many famous people are supporting the park.

Money talks.

The park was a “common ground” bringing diverse groups together.

There is a “common enemy” here.

7. Post information on the billboard. Add new information to ongoing class projects on the wall.

- new **concept** information can be added to the billboard
- an answer can be added to a question from the KWL Chart
- new information can be added to ongoing charts and investigations

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

Character Education at the Markkula Center for Applied Ethics

www.scu.edu/character

©SCU 2013

10. Collect data and post.

One possible activity:

If technology permits, have students research the current status of the park through internet resources. Provide resources such as newspapers for students to read about the situation. Have them research any local issues that could become a “commons cause.” Once the latest information is known, instruct students to write a letter of support to the proper individuals in charge (judge, attorney, city, or the people of the park). You could also use Google Earth to zoom in on the location. Students could research the address first.

Other possible activities for a class group or individual

- Bookmark Open Mind Portrait g6 Graphic Organizer
g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop
Poster Ad Map Retelling Reader’s Theatre Cartoon Rap

Key Questions

- What is environmental racism?
 Why is the South Central Garden such an emotional situation?
 How is the South Central Garden like the commons?
 What is the “tragedy of the South Central Garden”?

Remember to ask literal structural idea craft author literature life
evaluate and inference questions every day.

Bridge to a language building activity

Teach a Mini Lesson using *Write AHEAD*
 [The Write Ahead Activities are on individual work-pages in a separate file]

Have students predict what will happen next. Mark your calendar to keep up to date on this story.

Key Paragraph

The **South Central Farmers** consist of approximately 350 poor families from the neighboring community. They are a self-governing organization. This group has transformed the property from a junk filled space into one of the largest urban gardens. Since the notification of the impending destruction of the garden, the group has become politically active and has gathered supporters in politics, higher-learning, entertainment, and abroad.

EXTEND

11. Prompt every student to write a short product tied to today's reading.

When students hear about such a situation, they often want to become involved in some way. Use this interest to motivate them to action. Have students write a short paragraph outlining what they would personally like to do for the farmers in South Central. Follow up on their interest with further related activities.

12. Close with a short summary.

Extend the reading to the students' lives or to the world.

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Biology An Ecological Approach

Lesson Plan Quarter 1, Week 5, Day 4



Outcomes for Today

Standards Focus: 6bc

PREPARE

1. Background knowledge necessary for today's reading.

Groups of similar organisms form a population.

When populations become large, they impact their living environment.

Humans have produced significant impacts on the earth.

Humans are the primary reason for changes in the earth's environment.

(Introduce global warming here.)

Unequal distribution and consumption of the earth's resources by humans is causing major challenges to human populations. (Talk about this in terms of current situations in our world.)

2. Vocabulary Word Wall.

Introduce 5 important, useful words from today's reading.

urban smog ozone layer ground water acid rain
geographic range

- show, say, explain, expand, explode or buzz about the word briefly
- show, say and define the word quickly and add to the word wall

READ

3. Review the vocabulary and concepts previously covered in this chapter.

Start at the beginning and review the concepts and vocabulary covered so far.

- mention the setting and main ideas
- point to concept chart as you quickly review it

4. Read directions for investigation/activity.

5. Read text. Ch 2 Populations pp. 41-45 (2.11 & 2.12)

- Shared Reading RRP: Read, React, Predict every 2-3 pages
 Tape Partner Choral Silent Round Robin Reading

setting	Characters	pages
Once again Earth in many locations	Human populations	41-45

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events to the billboard

- discuss the text clarify the most important facts, concepts, ideas and vocabulary
- decide on the 3-5 most important **concepts** and post these on the **billboard**

Students might mention:

Examples of human-caused changes include smog, global warming, pollution of air and water, and acid rain.

Fighting among countries and different populations of people is getting in the way of solving these problems.

Africa is increasing the acreage of desert land each year.

Water is a major factor in population growth.

7. Post information on the billboard. Add new information to ongoing class projects on the wall.

- new **concept** information can be added to the billboard
- an answer can be added to a question from the KWL Chart
- new information can be added to ongoing charts and investigations

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity:

Our Population

This is the culmination of the ongoing activity that we began on the first day of this chapter. (Review Week 3 Day 5). Ask students to again think of their current school setting and that the students present and attending are a **population** of individuals. Have them determine the number of students present daily in graph format. Have them develop a graph to chart population fluctuation changes. Use the typical time-growth (X, Y) format with numbers going up the left side and time along the base. Review this graph for approximately two weeks as that is the timeline for this chapter. Ask students if their data validates their population predications. Have them complete their graph, write some conclusions, and make recommendations. Post their work.

Extra Activity:

Students could present their findings and recommendations to a school board meeting or similar forum.

Other possible activities for a class group or individual

- Bookmark Open Mind Portrait g6 Graphic Organizer
g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop
Poster Ad Map Retelling Reader's Theatre Cartoon Rap

Key Questions

If many countries can produce more than enough food for consumption, why are people starving in other countries?

List some of the problems associated with a population lacking resources?

Give examples of energy use in the production of food.

What kinds of barriers are used to keep human populations from moving to new areas?

What is a limiting factor on human population growth?

Remember to ask literal structural idea craft author literature life
evaluate and inference questions every day.

Key Paragraph

Our interactions with the community are complicated by the sheer numbers of humans on earth. These numbers have increased the rate, scale and complexity of those interactions. What once were local incidents of pollution now often involve several countries.

EXTEND

11. Prompt every student to write a short product tied to today's reading.

Make a copy of the illustration attached to the end of this lesson plan. Have students write a caption for the illustration and a "Plea from Earth!"

12. Close with a short summary.

Extend the reading to the students' lives or to the world.

Wow it is hot!



Student Directions:

Write a caption for this illustration.

Also write “A short plea from planet earth for my future!”

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Lesson Plan Quarter 1, Week 5, Day 5



Outcomes for Today

Standards Focus: 6bc

PREPARE

1. Background knowledge necessary for today's reading.
-

The short version of ecological interdependence:

Nothing happens in the biosphere in isolation as connections are everywhere. Political and governmental issues associated with many environmental issues (such as acid rain) make addressing and solving the problems complicated and complex. Share something current in this area that relates to your population.

2. Vocabulary Word Wall.
-

Introduce 5 important, useful words from today's reading.

Interdependent

affect

effect

acid rain

misnomer

- show, say, explain, expand, explode or buzz about the word briefly
- show, say and define the word quickly and add to the word wall

READ

3. Review the vocabulary and concepts previously covered in this chapter.
-

Start at the beginning and review the concepts and vocabulary covered so far.

- mention the setting and main ideas
- point to concept chart as you quickly review it

In order to understand and begin to solve a problem, scientists must break the problem down into components that can be studied. They can then begin to consider the variables using the scientific method.

A good review of the scientific method can be found at:

http://www.sciencebuddies.org/mentoring/project_scientific_method.shtml

Review the scientific method with students using a simple question/problem to be addressed.

4. Read directions for investigation/activity 3.1 pp. 78-80

A simplified Investigation 3.1 is attached to this lesson plan.

5. Read text. Ch3 *Communities and Ecosystems* p. 61 (Introduction)

- Shared Reading RRP: Read, React, Predict every 2-3 pages
 Tape Partner Choral Silent Round Robin Reading

setting	Characters	pages
Anywhere there are plants	Ants and aphids	60-61

RESPOND

6. Fix the facts. Clarify what's important.

Discuss the reading and add 3-5 events to the billboard

- discuss the text; clarify the most important facts, concepts, ideas and vocabulary
- decide on the 3-5 most important **concepts** and post these on the **billboard**

Students might mention:

From the introduction:

Ants control aphids. They are like the aphids' boss!

Things in nature are connected.

From the Investigation:

Rain isn't pure. It is slightly acidic.

Acid rain is a problem.

7. Post information on the billboard. Add new information to ongoing class projects on the wall.

- new **concept** information can be added to the billboard
- an answer can be added to a question from the KWL Chart
- new information can be added to ongoing charts and investigations

EXPLORE

8. Explore today's investigation with inquiry activities.

9. Explore today's simulation with inquiry activities.

10. Collect data and post.

One possible activity:

Begin investigation 3.3....on page 83. It is important to give students a little background on acid rain before beginning the investigation. The text on page 83 in the first paragraph is a good introduction. For more information go to:

http://www.ace.mmu.ac.uk/eae/Acid_Rain/Older/Acid_Rain_Introduction.html

Or use the simplified format attached to this lesson plan.

Other possible activities for a class group or individual

Bookmark Open Mind Portrait g6 Graphic Organizer
g7 Main Idea Graphic Organizer c1-12 Cubing Postcard Prop
Poster Ad Map Retelling Reader's Theatre Cartoon Rap

Key Questions

From the text.

How do ants benefit from their relationship with aphids?
 How do aphids benefit from their relationship with the ants?
 Does matter flow or cycle through the environment?
 Does energy flow or cycle through the environment?
 What is the difference between flowing and cycling?

From the introduction to Investigation 3.3

Explain the difference between a base and an acid. Give examples of each.
 Explain how acid rain forms.

Remember to ask literal structural idea craft author literature life
evaluate and inference questions every day.

Key Paragraph

In the web of life organisms are interdependent. Not only do individuals and populations interact with one another, but organisms also affect and are affected by the nonliving parts of their environment. Some interactions are favorable. Some are harmful. All involve the transfer of matter and energy.

EXTEND

11. Prompt every student to write a short product tied to today's reading

The Story of Ants and Aphids

In nature, the connection between ants and aphids is an example of a mutual benefit relationship. One organism (the ant) cares for a group of organisms (aphids) for the good of both. A student was overheard to say that the ants “pimp” the aphids. Do you agree with this statement? Write a short paragraph supporting your point of view.

Extension

Write a short rap about ants and aphids.

12. Close with a short summary.

Extend the reading to the students' lives or to the world.



Ch. 1 Student Investigation # 3.3 2 weeks

Acid Rain and Seed Germination Teacher Directions

Note: This activity is a simplified version of the one in the text. You may choose to extend this activity as outlined in the text. Please read the information on page 83 even if you are going to do the simplified version.

Objective: To begin to understand the impact of acid rain on seed germination (sprouting)

Materials: Observation Form (template attached), pair of working eyes, pencil, bean seeds, paper towels, plastic Petri dishes or clear plastic drinking cups, small ruler.

Introduction

Begin with this question to students. "Do you think acid rain can impact the ability of seeds to sprout? Form a hypothesis (scientific guess) and state your hypothesis." Have them write this on the form.

Teacher Note: Prepare several solutions of different concentrations acidic solutions by simply adding vinegar to bottled water accordingly:

Solution mix	Concentration	Label
Solution 1	Bottled water with no vinegar.	Pure water
Solution 2	30 Parts bottled water 1 part vinegar.	Slightly acidic
Solution 3	20 Parts bottled water 1 part vinegar	Moderately Acidic
Solution 4	10 Parts bottled water 1 part vinegar	Greatly Acidic

Label each solution.

Directions: Prepare the four solutions. Obtain bean seeds. You can use easily obtained Petri dishes (plastic) or you can substitute a suitable container. For example, you could place seeds in a plastic drinking glass (clear) and put paper towels in the center to hold the water and moisture. Divide the class into four groups (one with each solution). Note: it is best to have students work in teams of two-three. There can be several teams in each group. Have students prepare the experiment the first day. Thereafter, have them check the seed germination progress each day. Once the seeds sprout, have them measure the root length and make any other observations.

Activity and Schedule

This activity works best if carried out over a two week time. Spend time coaching the students in setting everything up the first day. Make sure the seeds are kept wet but not overly soaked. Observe the specimens each day to record progress. (Subsequent lesson plans will contain a reminder.) On the last day have them answer these questions:

1. In what solution did the seeds do the best growth-wise?
2. In what solution did they do the worst?

3. Do you think acid rain has an impact on seed germination and growth? Why?



CBL Seed Growth Observation Form

Name _____ Date _____

Solution _____

Directions: Complete observations and recordings as outlined by your teacher as well as the investigation directions.

Day	Length of Bean Shoot
-----	----------------------

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Comments/ Hypothesis:

